SUMMARY

In the present study two experiments entitled “Studies on the influence of intercropping on populations of insect pests, natural enemies and incidence of insect pests, natural enemies and other arthropods on sole crops were conducted in randomized block design and the salient findings emanated from the results are as follows.

Sucking pest incidence
Cotton monocrop contained highest population of *Bemisia tabaci* (whiteflies) from third week of August to the third week of December. Cotton + soybean recorded minimum incidence of whitefly throughout the period. Incidence of whiteflies in cotton + black gram was higher than cotton + red gram or green gram.

The *Thrips tabaci* population exhibited gradual decline in all the cropping treatments but in cotton + soybean it crashed abruptly after the second peak and was significantly very low compared to any of the cropping systems. Cotton + red gram consistently had high population of thrips.

On critical perusal, it was evident that two peaks were observed, the first peak during second week of September and the second peak during fourth week of September in cotton + red gram and in cotton monocrop, respectively. Jassid populations were oscillated, in general during the entire period of observations. Cotton monocrop exhibited significantly higher population as compared to cotton grown with different intercrops. Soybean among all intercrops was judged as best in reducing jassid population to an extent of nearly 50 per cent over monocrop.

Among the cropping systems, cotton + soybean recorded consistently and significantly lowest percent plants infested by aphids (*Aphis gossypii*) followed by cotton.
+ red gram as intercrop was found to contain lesser per cent plants infested compared to either green gram or black gram as intercrops.

**Lepidopterous pests**

Cotton monocrop and cotton + red gram significantly had highest larval infestation of *H.armigera* compared to other cropping systems and among the latter, cotton + soybean exhibited the lowest larval infestation.

The larval infestation of tobacco cutworm *Spodoptera litura* was 4 – 40% less in intercropped cotton than in monocrop. Cotton + soybean and cotton + red gram contained significantly lesser infestation than cotton intercropped with black gram or green gram.

The pink bollworm *Pectinophora gossypiella* damage was not showing any variation in different cotton intercropped situations including the monocrop.

The damage caused by spotted bollworm *Erias vitella* was lowest in all the cropping systems with cotton whereas in cotton monocrop it was significantly higher.

**Insect infestation in intercrops**

The insect pest infestation in intercrops when grown separately was on par with the monocrop of cotton on the natural enemies populations among the intercrops were not significantly differing. However the population levels were as good as those observed when the intercrops were grown in companion with cotton.

**Population of important natural enemies**

**Predators**

In case of the ladybird beetle *Cheilomenes sexmaculata*, it was concluded that in all the cropping modules, the peaks coincided. Egg population exhibited
peaks, first in fourth week of August, second in third or fourth week of September and finally, third on in second week of October, when highest peak was observed in cotton + soybean.

Larval population registered two peaks, first one in first week of September in all cropping systems, second one in fourth of week of the same month in cotton + soybean, a week later in cotton + red gram and cotton + black gram. In monocrop the peaks did not coincide with the others and appeared in October second week. In cotton with green gram only one peak was noticed.

The peaks in pupal population, were not coinciding in all the crop modules. Two peaks were noticed expect in cotton with black gram where only one peak was observed.

Adult populations in different cropping modules showed distinct variations in density and the peaks were not exactly coinciding with each other. Three peaks were observed in cotton + soybean, where as only two in cotton + red gram and cotton + black gram. Only one peak was noticed in cotton with green gram. In monocrop also two peaks were observed.

Regarding the green lacewings, *Chrysopa* sp. cotton with either soybean or red gram as intercrop significantly and consistently showed higher activity of adults of *Chrysopa* sp. Between black gram and green gram as intercrops with cotton, lacewings preferred green gram better than black gram. As was the case with adult activity, similar trend was noticed with oviposition and larval behaviour of the predator.

In case of spiders there was generally higher activity in all the cropping systems, however highest activity was noticed in cotton + soybean intercropping system.
followed by cotton + red gram. The species abundance of spiders was also rich in cotton + soybean intercropping system.

Regarding Geocorid predator population intercropping combinations of cotton were significantly superior to cotton monocrop. Among intercrop combinations cotton + soybean followed consistently by cotton + red gram were observed to have higher number predatory bugs.

**Parasitization**

Significantly lowest percent egg parasitization by *Trichograma* of *Helicoverpa* eggs was observed with cotton + red gram intercropping. Where as highest percent parasitization was noticed with cotton + soybean intercropping. Intercropping with black gram or green gram had no significant impact over monocrop.

Larval parasitization of *H.armigera* was significantly improved with different intercropping systems over monocrop. Consistently high levels of parasitization was observed with cotton + soybean intercropping.

Regarding parasitization by *Encarsia* in cotton + soybean intercropping system highest parasitization of whitefly pupae was observed followed by cotton + red gram.

The parasitization of *A.gossypii* by *Aphilinus* sp. was significantly highest in cotton + soybean intercropping closely followed by cotton intercropping with red gram.

**Soil dwelling insects:**

Detrivorous insects viz., Collembola and millipedes were significantly in highest number in the decaying leaf litter of cotton + red gram intercropping
The carabid beetle population was significantly highest in cotton intercropped with soybean or red gram. Cotton monocrop was also in many observations exhibited higher activity of the predators.

Among all the cropping systems cotton + black gram with 1.81 LER was found to be the best combination followed by cotton + soybean (1.70). The highest base crop equivalent yield was realized with cotton + soybean (2381 kg/ha) followed by cotton + green gram (2377 kg/ha) and least BCEY was recorded with cotton + red gram (2176 kg/ha). The cost benefit ratio of cotton with different intercrops ranged from 1:2.3 to 1:2.5 compared to monocrop 1:1.4.